



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.    | CONFIRMATION NO. |
|---|-------------|----------------------|------------------------|------------------|
| 10/500,259  | 06/25/2004  | Paul M. Lindberg     | 104497-423-PCT(US)     | 8922             |
| 7590  | 03/02/2006  |                      | EXAMINER<br>LE, DANG D |                  |
| Goodwin Procter<br>103 Eisenhower Parkway<br>Roseland, NJ 07068 |             |                      | ART UNIT               | PAPER NUMBER     |
|   |             |                      | 2834                   |                  |

DATE MAILED: 03/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/500,259

Applicant(s)

LINDBERG ET AL.

Examiner

Dang D. Le

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 and 21-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 21 and 23 is/are allowed.
- 6) ☒ Claim(s) 1-19 and 22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments with respect to claims 1-19 and 22 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Objections***

2. Claim 4 is objected to because of the following informalities: replace "cm" at line 3 with – can --. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claim 22 is rejected under 35 U.S.C. 102(b) as being anticipated by Hallidy (5,734,209).

Regarding claim 22, Hallidy shows a method of making a magnetic shaft comprising the steps of:

- Providing a stack comprising a plurality of discrete magnets (20-23, Figure 2) having an initial stack diameter;

Art Unit: 2834

- Providing a sleeve (62) having a magnetic permeability greater than 2.0; and
- Assembling the stack and the sleeve to form a shaft.

5. Claims 1 and 7 are rejected under 35 U.S.C. 102(e) as being anticipated by Nakagishi (6,424,068).

Regarding claim 1, Nakagishi shows a magnetic motor (Figures 29 and 48-50) comprising:

- A first motor assembly (250) comprising:
  - A first bearing surface layer (253), and a first magnet (148), fixed with respect to the first bearing surface layer, structured to generate a first magnetic field; and
- A second motor assembly (260) comprising:
  - A second bearing surface layer (251), located so that at least a portion (tip of 251) of the second bearing surface layer is in contact with at least a portion of the first bearing surface (Figure 48) layer, with the second bearing surface layer comprising a material that has relative magnetic permeability of  $x$ , wherein  $x$  is greater than 2.0, and
  - A second magnet (146 – must not only mean permanent magnet as further recited in claim 4), fixed with respect to the second bearing surface layer, structured to generate a second magnetic field, with the first and second motor assemblies being structured so that forces caused by the interaction of the first and second magnetic fields will cause the first motor assembly (rotor) and the second motor assembly (stator) to move relative (rotating) to each

other, and with the first (253) and second (251) bearing surface layers being in moving (251 and 253 can rotate and move up and down) contact to at least partially guide the relative motion of the first and second motor assemblies.

Regarding claim 7, it is noted that Nakagishi also shows the hard steel (251 being made of ferromagnetic stainless steel).

6. Claims 1-3, 5, 8-10, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Mielke (6,157,100).

Regarding claim 1, Mielke shows a magnetic motor (Figure 3) comprising:

- A first motor assembly (17) comprising:
- A first bearing surface layer (surface of 19), and a first magnet (14a), fixed with respect to the first bearing surface layer, structured to generate a first magnetic field; and
- A second motor assembly (6) comprising:
- A second bearing surface layer (surface of 7), located so that at least a portion of the second bearing surface layer is in contact with at least a portion of the first bearing surface layer, with the second bearing surface layer comprising a material that has relative magnetic permeability of  $x$ , wherein  $x$  is greater than 2.0 (soft magnetic material), and
- A second magnet (6), fixed with respect to the second bearing surface layer, structured to generate a second magnetic field, with the first and second motor assemblies being structured so that forces caused by the interaction of the first and second magnetic fields will cause the first motor assembly and

the second motor assembly to move relative (left-right) to each other, and with the first and second bearing surface layers being in moving contact to at least partially guide the relative motion of the first and second motor assemblies.

Regarding claim 2, it is noted that Mielke also shows the motor being high thrust.

Regarding claims 3 and 5, it is noted that Mielke also shows  $x$  being greater than 100 and a doubly salient motor.

Regarding claim 8, the claim is similar to claim 1 except that it recites that the second bearing surface layer having a magnetic permeability, saturation characteristic, shape and location so that at least a portion of the second bearing surface layer is magnetically saturated by a magnetic field of the second magnet. It is noted that Mielke also shows second bearing surface layer (surface of 7) having a magnetic permeability, saturation characteristic (made of soft magnetic), shape (of a disk) and location (axially within the coil 16) so that at least a portion (circumferential surface) of the second bearing surface layer is magnetically saturated by a magnetic field of the second magnet.

Regarding claims 9 and 10, Mielke also shows the unsaturated portion being the center of the soft magnetic disk (7) and the saturated and unsaturated portions being located in the vicinity of the second magnet (16).

Regarding claim 18, the claim is similar to claim 1 except that it recites the second bearing surface layer being anisotropic in its magnetic permeability. It is noted

Art Unit: 2834

that Mielke also shows the second bearing surface layer being anisotropic in its magnetic permeability (axial field of (7) being different with radial field).

7. Claims 13 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Hajec (Re 36,202)

Regarding claim 13, Hajec shows a magnetic motor (Figure 8) comprising:

- A first motor assembly (150) comprising:
- A first bearing surface layer (20d), and
- A first magnet (136d), fixed with respect to the first bearing surface layer, structured to generate a first magnetic field; and
- A second motor assembly (140d) comprising:
- A second bearing surface layer (17d), located so that at least a portion of the second bearing surface layer is in contact with at least a portion of the first bearing surface layer, with the second bearing surface layer comprising a material that has a residual magnetization value of  $x$ , wherein  $x$  is greater than 500 Gauss (because of magnets 24d), and
- A second magnet (138D), fixed with respect to the second bearing surface layer, structured to generate a second magnetic field, with the first and second motor assemblies being structured so that forces caused by the interaction of the first and second magnetic fields will cause the first motor assembly and the second motor assembly to move relative (rotating) to each other, and with the first and second bearing surface layers being in moving

contact to at least partially guide the relative motion of the first and second motor assemblies.

Regarding claim 14, it is noted that Hajec also shows residual magnetization being greater than 1000 Gauss (magnet 24D).

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 4, 6, 11, 12, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mielke in view of Trench (3,149,255).

Regarding claims 4, 11, and 19, Mielke shows all of the limitations of the claimed invention including the first motor assembly being a stator; the first bearing surface layer comprising a bushing; the first magnet being an electromagnet such that the first



magnetic field can be selectively controlled; the second motor assembly comprise at least one permanent magnet except for the shaft; the second bearing surface layer being located over at least a portion of the shaft; and the second magnet located within the shaft.

For the purpose of transmitting output power externally, Trench shows the shaft (24); the second bearing surface layer (surface of pole 18) being located over at least a portion of the shaft; and the second magnet (17) located within the shaft.

Since Mielke and Trench are all from the same field of endeavor; the purpose disclosed by one inventor would have been recognized in the pertinent art of the others.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to include the shaft as taught by Trench for the purpose discussed above.

Regarding claim 6, it is noted that Trench also shows the shaft comprises: a plurality of annular permanent magnets (17); a plurality of pole pieces (18), with the magnets and the pole pieces being assembled in an alternating manner (Figure 1); and a sleeve (19) disposed at least partially around the alternating magnets and pole pieces (not claimed "entirely"), with the sleeve comprising an outer major surface, and the second bearing surface layer (surface of poles 18) being located at least partially along the outer major surface of the sleeve.

Regarding claim 12, it is noted that Mielke also shows the unsaturated and saturated portions, which are the center and surface of the disk (7), respectively.

Art Unit: 2834

11. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hajec in view of Miyaji et al. (5,134,331).

Regarding claim 15, Hajec shows all of the limitations of the claimed invention including the first bearing surface layer comprising a bushing (20D), the first magnet (138D) being an electromagnet, such that the first magnetic field can be selectively controlled; the second motor assembly comprising a shaft (24D); the second bearing surface layer is located over at least a portion of the shaft except for the first motor assembly being a stator and the second magnet located within the shaft and comprises at least one permanent magnet.

Miyaji et al. shows the first motor assembly being a stator (Figure 6, 134) and the second magnet (52) located within the shaft (4) and comprises at least one permanent magnet (52) for the purpose reducing magnetic flux leakage.

Since Hajec and Miyaji et al. are all from the same field of endeavor; the purpose disclosed by one inventor would have been recognized in the pertinent art of the others.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to make the first motor assembly as a stator and to locate the second magnet within the shaft and comprising at least one permanent magnet as taught by Miyaji et al. for the purpose discussed above.

12. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mielke (6,157,100) in view of Nanba et al. (5,909,066).

Regarding claim 13, Mielke shows all of the limitations of the claimed invention except for the second bearing surface layer comprising a material that has a residual

magnetization value of  $x$ , wherein  $x$  is greater than 500 Gauss. The second bearing surface layer of Mielke is made of soft magnetic disk (7).

Nanba et al. shows the second bearing surface layer (SM, Figure 9A, contacting bearing Br) comprising a material (61, Figure 3A) that has a residual magnetization value of  $x$ , wherein  $x$  is greater than 500 Gauss (61 being magnets) for the purpose of increasing stroke.

Since Mielke and Nanba et al. are all from the same field of endeavor; the purpose disclosed by one inventor would have been recognized in the pertinent art of the others.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to make the second bearing surface layer comprising a material that has a residual magnetization value of  $x$ , wherein  $x$  is greater than 500 Gauss (i.e. to make the members 7 of Mielke as magnets) as taught by Nanba et al. for the purpose discussed above.

13. Claims 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mielke in view of Nanba et al. and further in view of Trench (3,149,255).

Regarding claim 15, the machine of Mielke modified by Nanba et al. includes all of the limitations of the claimed invention including the first motor assembly being a stator; the first bearing surface layer comprising a bushing; the first magnet being an electromagnet such that the first magnetic field can be selectively controlled; the second motor assembly comprise at least one permanent magnet except for the shaft; the

Art Unit: 2834

second bearing surface layer being located over at least a portion of the shaft; and the second magnet located within the shaft.

For the purpose of transmitting output power externally, Trench shows the shaft (24); the second bearing surface layer (surface of pole 18) being located over at least a portion of the shaft; and the second magnet (17) located within the shaft.

Since Mielke, Nanba et al., and Trench are all from the same field of endeavor; the purpose disclosed by one inventor would have been recognized in the pertinent art of the others.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to include the shaft as taught by Trench for the purpose discussed above.

Regarding claims 16 and 17, it is noted that Mielke and Trench also shows motor being doubly salient motor and the shaft comprising: a plurality of annular permanent magnets (17); a plurality of pole pieces (18), with the magnets and the pole pieces being assembled in an alternating manner (Figure 1); and a sleeve (19) disposed at least partially around the alternating magnets and pole pieces (not claimed "entirely"), with the sleeve comprising an outer major surface, and the second bearing surface layer (surface of poles 18) being located at least partially along the outer major surface of the sleeve.

***Allowable Subject Matter***

14. Claims 21 and 23 are allowed.

***Information on How to Contact USPTO***

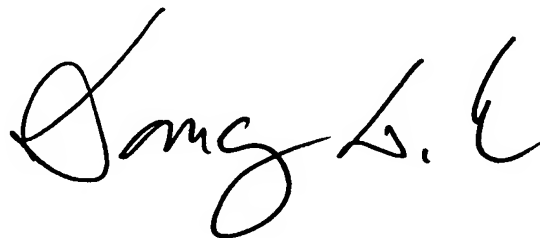
Art Unit: 2834

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dang D. Le whose telephone number is (571) 272-2027. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on (571) 272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

2/25/06

A handwritten signature in black ink, appearing to read "Dang D. Le". The signature is fluid and cursive, with the first name "Dang" being more prominent.

DANG LE  
PRIMARY EXAMINER